

REMARKS

Claims 1, 3-6, and 8-10 were pending in the patent application. The Examiner has finally rejected Claims 1, 3-6 and 8-10 under 35 USC 103(a) as unpatentable over Ho. By this amendment, Applicants amend the language of independent Claims 1 and 6 and cancel the remaining claims. Applicants believe that the amended claims are patentable over the cited art.

The present invention provides a novel apparatus and method for managing mobile agents wherein agent servers maintain not only the history of movements of mobile agents at their locations but also keep a count of the accumulated total of movements by each of the mobile servers for which the agent servers have a history. In addition, the agent servers generate requests for updating registration server locations and periodically communicate the requests to the registration server, wherein the requests include the history of movements with the accumulated counts. At the registration server, tables are updated for any given mobile agent using only the information that is accompanied by the highest count

of accumulated movements, thereby avoiding updating with stale information. Independent Claims 1 and 6 recite the apparatus and method.

As set forth in independent Claim 1, the invention is a mobile agent management apparatus comprising a plurality of agent servers (page 2, line 19, 1242 and 1244 of Fig. 12); and a registration server (page 2, lines 19-20 and 1245 of Fig. 12) for maintaining location information of mobile agents, wherein each of the plurality of agent servers comprises means (1246 of Fig. 12) for maintaining a history of movement of each of said mobile agents (page 2, lines 21-22) including a counter for accumulating a count of the accumulated number of movements for each of said mobile agents (page 3, lines 6-7); and request means (1247 of Fig. 12) for periodically generating requests for updating location information of each of said agents (page 3, lines 5-6), said requests including at least a mobile agent identifier and said accumulated number of movements for said mobile agent, to renew location information at said registration server (page 3, lines 9-10), and wherein the registration server includes at least one register for

maintaining the accumulated number of movements and locations of each of the mobile agents and renews the location information only upon receipt of location update requests that have a higher accumulated number of movements than was previously found in the register.

As set forth in independent method Claim 6, the method comprises steps of, on each of the agent servers, maintaining history of movement of each of the mobile agents (page 12, lines 9-10) including accumulating a count of the number of movements for each of the mobile agents (page 14, line 18); and periodically generating requests (Figs. 23 and 24) for updating and deleting registries, said requests including at least a mobile agent identifier and said count of the accumulated number of movements for said mobile agent (page 8, lines 13 and 18); and at said registration server (Fig. 26), renewing location information of each of said mobile agents kept by said registration server with said requests (page 8, line 24-page 9, line 1) based on comparing the accumulated number of movements in an update request to a stored accumulated number of movements for the mobile agent and updating the location information only when the

accumulated number of movements in the update request exceeds the stored accumulated number of movements (page 3, lines 7-12 and page 14, lines 16-24). Information is updated only when the accumulated count of current movements exceeds the previous accumulated count of movements, thereby assuring that updates are not made based on stale information. The accumulated number of movements is an indication of the "freshness" (or "age") of the information carried therewith.

The Ho patent teaches a method and apparatus for tracking movements of a mobile station to determine where the mobile station is in relation to places it can call (its paging area). Ho teaches that the mobile station (e.g., a cell phone, Col. 4, lines 10-14) includes a movement history register 302 which it increases by "1" when it enters into a new cell coverage area (see: Fig. 6, steps 600-602). However, the movement counter in the Ho mobile devices does not record an absolute count of accumulated movements. Ho expressly teaches that, since a mobile station may perform so-called "loops", the newly "counted" movement may be removed from the counter/register if the cell region ID already appears in

the register, thereby indicating that the device has looped back (see: Col. 5, lines 21-41). "In response to identifying the presence of a loop, the loop is removed from the path" (see: Col. 2, line 66-Col. 3, line 1). Ho further teaches that "cell IDs are removed from the top of the movement history registers 404 until...the loop is removed" (Col. 5, lines 38-41) and "[m]ovement history register 404 and the path length counter stored in path length register 406 return to the original state as if no movement has occurred since initialization" (Col. 5, lines 45-48).

Ho is not teaching or suggesting "maintaining a history of movement of each of said mobile agents... [by] accumulating a count of the accumulated number of movements for each of said mobile agents" (see: Claims 1 and 6). Ho does not accumulate a count of all movements for a mobile device. Rather, Ho intentionally ~~removes~~ removes device movement information from its registers and maintains only a net count of device movements. The Ho movement information is an indication of actual physical location, not of so-called age or freshness of accompanying location information.

The non-removed information in the Ho movement history register 302, the so-called "loop-removed path", indicates a net path length of device movement. The path length is compared to a stored path length threshold (in movement threshold register 306) and, when the path length equals the threshold value, the mobile station reports its location to the mobile switching center (MSC) of the cellular region. After the device sends a location update "all cell IDs in the stack in movement history registers 302 are removed except the ID of the current cell" (Col. 5, lines 8-11). Ho further teaches in Col. 7, lines 15-18 that "all cell IDs are removed...and the value of the path length register 406, the movement counter 502, and the call counter 504 are set equal to 0 (step 614)". Ho clearly teaches, therefore, that the system does not keep any history of movements at the device. Further, Ho teaches in Col. 8, lines 23-29, that "[i]f the period of time exceeds the predefined movement threshold update interval, then a new movement threshold Th is determined...[and the] process then resets the value of cumulative movement counter MC and the cumulative call counter CC to zero".

The Examiner acknowledges that the Ho patent teaches "a counter for accumulating a count of the net number of movements" (page 3 of the FOA, line 2). Applicants have argued above that a count of the net number of movements is not the same as or suggestive of maintaining a history of movements by accumulating a count of the accumulated number of movements for each mobile agent. The Examiner has concluded that "it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the net movement number with a gross movement number" citing Col. 2, lines 42-51. For the purposes of the Ho patent, maintaining a gross number of movements, including any loops, would result in a path length which might meet or exceed the Ho threshold even if the present location of the mobile unit is the same as its previous location. Therefore, when Ho compares the path length of the gross number of movements to the stored path length threshold (in movement threshold register 306) without removing the loops, and when the gross path length equals the threshold value, the mobile station may be reporting its location to the mobile switching center (MSC) of the same cellular region that it had previously occupied.

Applicants believe that it would not be obvious to modify the invention in such a way as to make it superfluous and effectively unworkable for its intended purpose.

The Federal Circuit has stated that when patentability turns on the question of obviousness, the obviousness determination "must be based on objective evidence of record" and that "this precedent has been reinforced in myriad decisions, and cannot be dispensed with." (In re Lee, 277 F. 3d 1338, 1343 (Fed. Cir. 2002)). The Federal Circuit has stated that "conclusory statements" by an examiner fail to adequately address the factual question of motivation, which is material to patentability and cannot be resolved "on subjective belief and unknown authority" (Id. at 1343-1344). "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336, quoted with approval in KSR Int'l Co. v. Teleflex Inc., 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

Applicants further argue that Ho ~~expressly teaches~~ away from counting a gross movement number, stating at Col. 2, lines 37-39 that "reporting is necessary only when the mobile station is far away from its last updated location" and at Col. 2, lines 42-51 "the movement-based scheme...does not perform as well as the distance based scheme as the mobile station may be close to or at the last updated location even though it has performed a specified number of cell boundary crossings". References that teach away from the claimed invention or feature cannot be said to obviate that claim or claim feature (In re Gurley, 27 F.3d 551, 31 USPQ2d 1130 (Fed. Cir. 1994)).

The Examiner also acknowledges that "Ho does not specifically teach the generation of requests to update information" but concludes that it would be obvious to modify Ho's "transmittal and implementation of update information". The present invention teaches and claims that agent servers send requests for updates, but that the registration server might not, necessarily, update its information about the agent server sending the request. As detailed in the Specification at page 3, lines 7-12 and page 13, line 20-page 14, line 24, the

registration server compares the accumulated number of movements in an update request to a stored accumulated number of movements for the mobile agent and updates the location information only when the accumulated number of movements in the update request exceeds the stored accumulated number of movements (see also, Claims 5 and 10). Ho neither teaches nor suggests that updates from a mobile device be in the form of requests, nor that the MSC consider whether to implement updates with received information. Rather, the Ho mobile device sends the location update, the MSC temporarily updates its counters, determines whether a movement threshold update interval has elapsed, updates the movement threshold and then purges its counters of all information except the device's newest location (Col. 8, lines 8-35). Applicants assert that it would not be obvious to modify Ho to include update requests, in the absence of some teaching(s) to that effect.

Furthermore, if the Ho net movement history were used as a basis of updates, updates would be allowed based on incorrect movement history, which could then result in updates based on stale information, allowing

overwriting of more recent information. Accordingly, modifying Ho to include updating based on a net history of movement as compared to a dynamic threshold would result in a system having the very problem that the current invention overcomes by using a current gross count of movements compared to a previous gross count.

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art (In re Bell, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993)). "All words in a claim must be considered in judging the patentability of that claim against the prior art" (In re Wilson, 424 F. 2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970)). Since Ho does not teach means or steps for maintaining a history of movements which includes a counter for accumulating a count of the accumulated number of movements for each mobile agent, or steps or means for periodically generating requests for updating location information, or steps or means for a registration server to compare the accumulated number of movements in an update request to a stored accumulated number of

movements for the mobile agent and to update the location information only when the accumulated number of movements in the update request exceeds the stored accumulated number of movements (limitations from Claims 5 and 10 which are now incorporated into amended Claims 1 and 6) since Ho does not teach accumulated counts, does not teach update requests, does not teach storing a history of accumulated movements, and does not teach any comparison of accumulated counts.

Based on the foregoing amendments and remarks, Applicants respectfully request entry of the amendments, reconsideration of the amended claim language in light of the remarks, withdrawal of the rejections, and allowance of the claims.

Respectfully submitted,

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